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A NEW GENUS AND SEVERAL NEW SPECIES OF MEXICAN SCHIZOMIDS (SCHIZOMIDA: ARACHNIDA)

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As a result of extensive opilionid research carried out in México by Dr. Clarence and Mrs. Marie Goodnight several other interesting arthropods have come to light. The activities of The Association for Mexican Cave Studies have unearthed even more abundant materials. These two sources have provided not only several new species of the arachnid order Schizomida, but a singular new genus, for which I propose the name:

Heteroschizomus, new genus

Description.—The following is based on the male only, the female being unknown.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) produced into a horizontally directed cone, extremely convex; mesopeltidia small, divided by approximately their greatest length; metapeltidium entire; anterior sternum directed posteriorly well beyond coxa II.

Abdomen. Segment I to VI, and XII normal, VII to XI extremely elongate, capable of being telescoped. Flagellum one segmented in male.

Comparisons.—*Heteroschizomus* differs from all other genera in the extreme attenuation of the posterior abdominal segments.

Etymology.—The generic epithet from Greek *hetero*, meaning different, and *schizomus* from the genus *Schizomus*.

Type species.—The type and only known species of this genus is described as follows:

Heteroschizomus goodnightorum, new species

Holotype.—An adult male, taken at Chichén Itzá, Yucatán, México, in June 1948 by C. Goodnight, and deposited in the American Museum of Natural History, New York City.

Description.—The following describes the males.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with three pairs of dorsal and two apical setae, twice as long as wide, extremely convex, lateral margins vertical, produced anteromesally as a horizontal, conical process; eye spots very vaguely distinct as pale areas on anterolateral surface of carapace; mesopeltidia (second pair of cephalothoracic tergites) triangular, uncurved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, very strongly convex, lateral margin and medial portion equal in depth, anterior margin closely parallel with posterior margin of mesopeltidia, posterolateral margin of metapeltidial plates not associated with small, narrowly curved plate; anterior sternum triangular, apex extending well beyond caudal limit of coxae II, anterolateral margins curved; posterior sternum (metasternum) triangular, pointing cephalad, with six setae.

Abdomen. First abdominal tergum located equally between metapeltidium and segment II, triangular; terga II to VII with two setae; terga VIII and IX with four setae; segment XII with two dorsal, six lateral, and four ventral setae; lung books visible under second abdominal sternum; terga III to VII bearing darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as pale areas on sterna V to VII.

Flagellum. Very long and slender, horizontally flattened, bearing 16 setae; dorsal surface with central depression gradually dissipating distally.

Chelicerae. Lateral aspect of basal segment bearing three scattered setae, vertical group of two long, feathered setae flanking movable finger (second cheliceral segment), group of three shorter setae arranged basally on fixed digit, horizontal group of seven setae arising on or near ventral margin; mesal surface of basal segment bearing group of three setae arranged horizontally, lower group of four setae arranged vertically, first long, second short and thin, third and fourth short and stout, four setae in vertical group directly below large dorsal seta, movable finger flanked by another vertical group of two long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing seven closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 18 long,

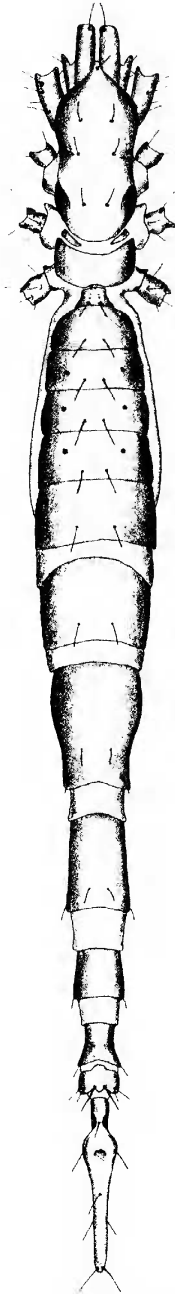
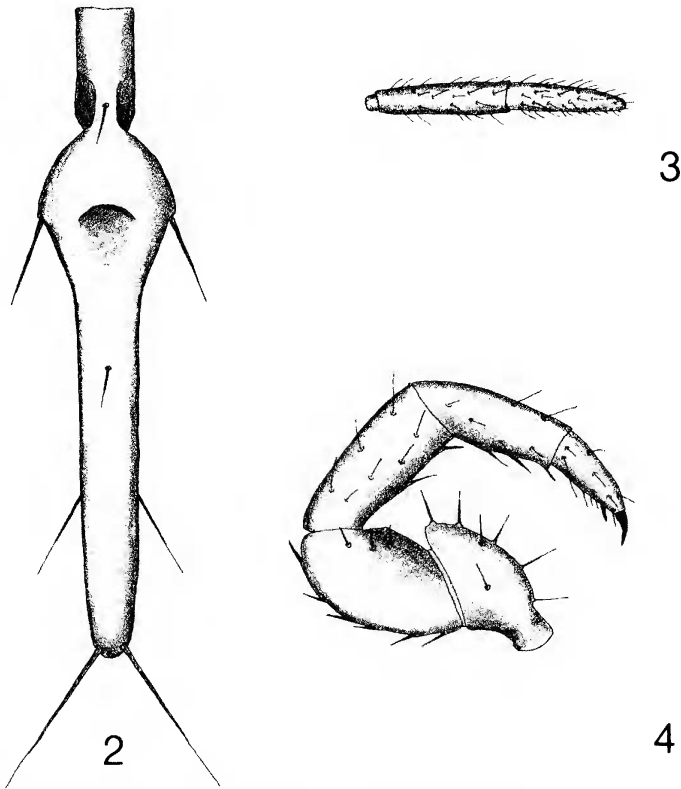


FIG. 1.—Dorsal view of male *H. goodnightorum*, pedipalps and legs omitted. Scale, one centimeter = 0.6 millimeter.



FIGS. 2-4.—Flagellum, tarsus of leg I and pedipalp of *H. goodnightorum*: 2, dorsal view of flagellum; 3, lateral view of tarsus of leg I; 4, lateral view of pedipalp. Scale for flagellum, one centimeter = .06 millimeter. Scale for tarsus and pedipalp, one centimeter = .25 millimeter.

feathered, distally curled setae near outer margin, another vertical row of 14 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella not variable in length, narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with one small spur just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $1 > 2$ (see remarks); anterolateral spur of coxa of leg II 40 per cent as long as coxa proper; patella of leg III 75 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—*Heteroschizomus goodnightorum* differs from the other species of the order in having abdominal segments VII to XI

extremely elongate. It is more closely related to *Schizomus* and *Trithyreus* than to other genera, and represents a specialization from these ancestral groups. The two or three teeth on the fixed digit of the chelicerae, pedipalpal spines, and pedipalpal claws of the more primitive *Agastoschizomus* and *Megaschizomus* easily separate their species from *H. goodnightorum*. The two-segmented nature of the first walking leg may be an anomaly of the paratype. Additional specimens will be necessary to determine the significance of this characteristic, see remarks.

Measurements.—The total length (from anterior margin of first cheliceral segment to end of flagellum) of the male holotype and paratype, both from the type locality, is 9.7 and 6.6, respectively. Because abdominal segments VII to XI appear to be able to be telescoped, the total length of a specimen is dependent on the extended condition of the abdomen when preserved. The abdomen of the paratype appears to be in a retracted condition, thus partially attributing to a much shorter total length than the holotype. Several appendages were partially or wholly missing from both specimens, which is reflected in Table 1. All measurements are in millimeters.

Variation.—No variation disproportionate to variation in appendage lengths was noted, except as stated above.

Distribution.—*H. goodnightorum* is known only from Chichén Itzá, Yucatán, México.

Remarks.—In describing this new genus I have been reluctant to include the two-segmented nature of the leg I. Both of the holotype's front legs are missing as is one of the paratype's, which leaves only the single leg. The tarsus of leg I in *T. schoutedeni* Roewer, 1954, is reported to have only six segments, one less than any other living species. However, I have encountered specimens of normally segmented species that display a complete loss of segmentation of the tarsus of leg I. This condition may be caused by regeneration of a lost limb. The selection of the holotype was made on the more normal specimen. The paratype was excluded due to the probable unnatural segmentation of the tarsus of the leg I. The paratype also contained a nematode that nearly filled the abdominal cavity and may have significantly affected the morphology of this specimen. This is the first record of any parasite associated with a schizomid.

Etymology.—The specific epithet is a patronym, given in honor of Dr. Clarence and Mrs. Marie Goodnight, Western Michigan University, Kalamazoo.

TABLE 1.—Selected measurements of *Heteroschizomus goodnightorum* (holotype and paratype), *Agastoschizomus pachypalpus* (holotype), *Schizomus orthoplax* (holotype), *Schizomus bartolo* (holotype), *Schizomus firstmani* (holotype), *Schizomus firstmani* (allotype), *Schizomus pecki* (holotype), *Schizomus pecki* (allotype).

| Variate | Pedipalp | Legs | | | |
|---|----------|-----------|---------|---------|-----------|
| | | I | II | III | IV |
| <i>Heteroschizomus goodnightorum</i> | | | | | |
| Coxa | .65-.58 | .68-.65 | .48-.45 | .39-.37 | .37-.36 |
| Trochanter | .33-.31 | .45-.38 | .25-.22 | .25 | .35-.32 |
| Femur | .45-.36 | 1.67-1.33 | .93-.83 | .77 | 1.35-1.16 |
| Patella | .55-.45 | | .52-.40 | .30 | .50-.45 |
| Tibia | .44-.35 | -1.55 | .63-.56 | .41 | .95-.80 |
| Basitarsus | | -1.15 | .51-.54 | .50 | .81-.70 |
| | .26-.24 | | | | |
| <i>Agastoschizomus pachypalpus</i> (holotype) | | | | | |
| Coxa | .44 | .36 | .41 | .37 | .37 |
| Trochanter | .21 | .30 | .18 | .18 | .45 |
| Femur | .37 | .79 | .71 | .69 | .80 |
| Patella | .42 | | .39 | .34 | .44 |
| Tibia | .37 | .70 | .44 | .36 | .66 |
| Basitarsus | | .80 | .30 | .35 | .49 |
| Tarsus | .20 | .81 | .30 | .34 | .38 |
| <i>Schizomus orthoplax</i> (holotype) | | | | | |
| Coxa | .46 | .43 | .34 | .30 | .27 |
| Trochanter | .27 | .28 | .19 | .17 | .23 |
| Femur | .29 | 1.02 | .60 | .53 | .94 |
| Patella | .31 | | .31 | .20 | .37 |
| Tibia | .30 | 1.24 | .38 | .30 | .64 |
| Basitarsus | | .85 | .38 | .37 | .51 |
| Tarsus | .15 | .82 | .28 | .31 | .39 |
| <i>Schizomus bartolo</i> (holotype) | | | | | |
| Coxa | .41 | .43 | .33 | .28 | .25 |
| Trochanter | .26 | .25 | .16 | .16 | .28 |
| Femur | .33 | 1.16 | .70 | .63 | 1.05 |
| Patella | .36 | | .38 | .27 | .35 |
| Tibia | .30 | 1.47 | .50 | .41 | .78 |
| Basitarsus | | 1.13 | .43 | .47 | .68 |
| Tarsus | .19 | .95 | .38 | .41 | .48 |

TABLE 1.—Continued.

| | | | | | |
|------------|---------------------------------------|------|------|------|------|
| | <i>Schizomus bartolo</i> (allotype) | | | | |
| Coxa | .48 | .45 | .38 | .32 | .27 |
| Trochanter | .26 | .28 | .17 | .16 | .28 |
| Femur | .34 | 1.09 | .68 | .60 | 1.00 |
| Patella | .32 | | .32 | .28 | .36 |
| Tibia | .28 | 1.41 | .53 | .38 | .77 |
| Basitarsus | | 1.11 | .37 | .38 | .68 |
| Tarsus | .20 | | | | |
| | | .86 | .36 | .40 | .42 |
| | <i>Schizomus firstmani</i> (holotype) | | | | |
| Coxa | .59 | .63 | .46 | .40 | .38 |
| Trochanter | .31 | .30 | .24 | .25 | .33 |
| Femur | .45 | 1.85 | 1.15 | 1.00 | 1.63 |
| Patella | .54 | | .56 | .40 | .62 |
| Tibia | .48 | 2.12 | .80 | .69 | 1.18 |
| Basitarsus | | 1.48 | .59 | .63 | 1.02 |
| Tarsus | .25 | | | | |
| | | 1.20 | .45 | .49 | .61 |
| | <i>Schizomus firstmani</i> (allotype) | | | | |
| Coxa | .69 | .65 | .51 | .45 | .39 |
| Trochanter | .36 | .30 | .26 | .28 | .39 |
| Femur | .64 | 1.80 | 1.06 | 1.00 | 1.58 |
| Patella | .75 | | .57 | .45 | .50 |
| Tibia | .55 | 2.10 | .78 | .56 | 1.04 |
| Basitarsus | | 1.40 | .55 | .68 | .93 |
| Tarsus | .26 | 1.17 | .49 | .50 | .55 |
| | <i>Schizomus pecki</i> (holotype) | | | | |
| Coxa | .70 | .80 | .50 | .47 | .38 |
| Trochanter | .39 | .35 | .29 | .25 | .45 |
| Femur | .66 | 2.24 | 1.21 | 1.10 | 1.96 |
| Patella | .83 | | .57 | .50 | .65 |
| Tibia | .64 | 3.74 | .90 | .75 | 1.36 |
| Basitarsus | | 2.12 | .79 | .80 | 1.14 |
| Tarsus | .30 | | | | |
| | | 1.25 | .53 | .50 | .59 |
| | <i>Schizomus pecki</i> (allotype) | | | | |
| Coxa | .85 | .86 | .55 | .51 | .43 |
| Trochanter | .50 | .41 | .31 | .29 | .45 |
| Femur | .68 | 2.44 | 1.20 | 1.17 | 1.82 |
| Patella | .80 | | .61 | .55 | .63 |
| Tibia | .71 | 2.50 | .85 | .71 | 1.30 |
| Basitarsus | | 1.88 | .73 | .84 | 1.04 |
| Tarsus | .35 | | | | |
| | | 1.16 | .51 | .52 | .63 |

Agastoschizomus pachypalpus, new species

Holotype.—An adult female, taken at Nacimiento del Río Frío, 3 mi. S Gómez Farías, Tamaulipas, México, on 12 March 1969 by James Reddell, and deposited in the American Museum of Natural History.

Paratypes.—Two adult females and one juvenile taken at Arroyo Nacimiento del Río Frío, Tamaulipas, México, on 16 February 1970 by R. W. Mitchell; an adult female taken at Gómez Farías, Tamaulipas, México, on 6 January 1964 by J. Reddell, D. McKenzie and L. Manire; and one juvenile taken at the same locality on the same date by the same collector as the holotype; all are deposited in the American Museum of Natural History.

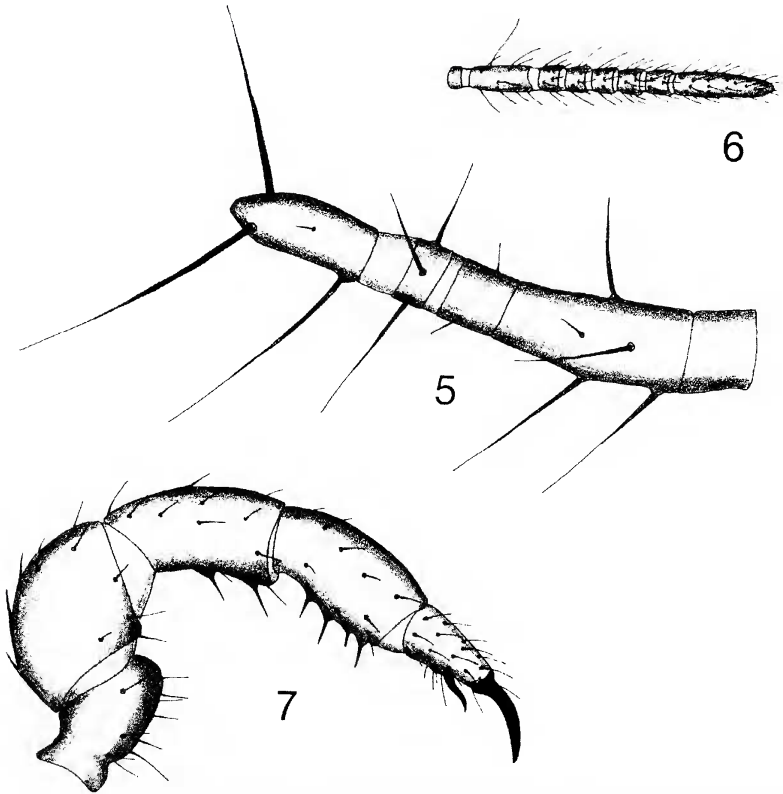
Description.—The following describes the females.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with five pair of dorsal and two apical setae, less than twice as long as wide, gently convex, lateral margins recurved inward, nearly vertical, produced anteromesally as a basally blunt conical process; eye spots absent from anterolateral surface of carapace; mesopeltidia (second pair of cephalothoracic tergites) long, acutely triangular, not curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) divided medially into two plates, medial margin of metapeltidial plates shorter than curving lateral margins, anterior margin closely parallel with posterior margin of mesopeltidia, but slightly divergent medially, posterolateral margin of metapeltidial plates associated with small, narrowly curved plate; anterior sternum with 11 setae, triangular, apex extending just to caudal limit of coxae II, anterolateral margins gently curved; posterior sternum (metasternum) with four setae, triangular.

Abdomen. First abdominal tergum located closer to second abdominal segment than to metapeltidium, chevron shaped; terga I to II with two setae, III to IV with four setae; V to IX with six setae; segment X with 13 setae; segment XI with 13 setae; and segment XII with two dorsal, four lateral, nine ventral setae; lung books not visible under second abdominal sternum; terga III to VIII bearing slightly darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII.

Flagellum. Long, rod shaped, curved upward, with three segments and two sections, bearing 18 major and six minor setae.

Chelicerae. Lateral aspect of basal segment bearing three setae, vertical group of five long, feathered setae flanking movable finger (second cheliceral segment), no setae arranged basally on fixed digit,



FIGS. 5-7.—Flagellum, tarsus of leg I and pedipalp of *A. pachypalpus*: 5, lateral view of flagellum; 6, lateral view of tarsus of leg I; 7, lateral view of pedipalp. Scale for flagellum, one centimeter = .06 millimeter. Scale for tarsus and pedipalp, one centimeter = .25 millimeter.

horizontal group of 12 setae arising on or near ventral margin; mesal surface of basal segment bearing group of two setae arranged vertically in center, another group of nine feathered setae arranged vertically, directly below large dorsal seta, movable finger flanked by another vertical group of two long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing no closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of about 15 long, feathered, distally curled setae near outer margin, another vertical row of seven knobs or very blunt teeth near inner surface.

Pedipalps. Trochanter not produced distally; femur and patella not variable in length, narrow proximally, expanded distally; tibia

without mesal, subapical spur; tarsus-basitarsus with two long spurs just above claw; all segments robust; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $7 > 1 > 2, 3, 4, 5, 6$; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 80 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—*A. pachypalpus* is the second species to be assigned to this genus. *A. lucifer* Rowland, 1971, is much larger, sometimes attaining a total length of 15 millimeters. Some of the very young instars of *A. lucifer* are about the size of *A. pachypalpus*, but the former can be distinguished by their very pale color. This species can also be readily distinguished from any other epigeal female Mexican schizomid by the segmented and annulated nature of the flagellum, see Fig. 22 for comparison with flagellum of *A. pachypalpus*.

Measurements.—The total length of the allotype is 5.3. See also Table 1.

Variation.—No variation disproportionate to total length was noticed.

Distribution.—*A. pachypalpus* is known from the environs of Gómez Farías, Tamaulipas, México.

Remarks.—This new species adds greatly to the understanding of this genus. *A. lucifer* is a remarkable troglobitic species, with one or two closely related undescribed forms from other caves in its area. *A. pachypalpus* is similar to the previous species but appears to be exclusively epigeal. It has been collected near the entrance of a frequently visited cave, but has not been found inside, though *S. mexicanus* Rowland, 1971, has been collected there on several occasions. Several hours of search by four people in specific quest of this animal on 16 March 1972 at the type locality failed to produce any more of these very interesting and important animals.

Etymology.—The specific epithet from Greek, *pachy*, meaning thick and Latin, *palpus*, meaning palp, describing the robust nature of the pedipalps.

Schizomus orthoplax, new species

Holotype.—An adult male, taken at the Finca Cuauhtemoc, Chia-pas, México, on 8 May 1950 by C. and M. Goodnight, and deposited in the American Museum of Natural History.

Description.—The following describes the male.

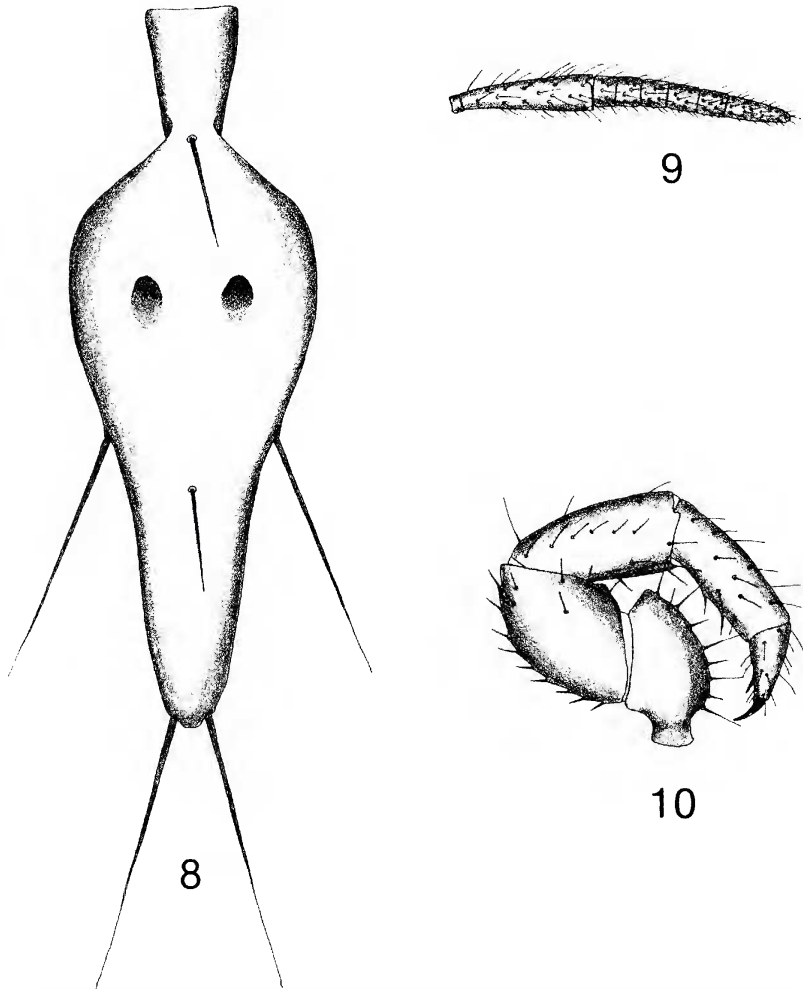
Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with four pair of dorsal and two apical setae, less than twice as long as wide, gently convex, lateral margins nearly vertical, produced anteromesally as a sharp conical process; eye spots fairly distinct as nearly circular pale areas on anterolateral surface of carapace; mesopeltidia (second pair of cephalothoracic tergites) triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, emarginate posteriorly, anterior margin closely parallel with posterior margin of mesopeltidia, posterolateral margin of metapeltidial plates associated with small, narrowly curved plate; anterior sternum with 11 setae, triangular, apex extending well beyond caudal limit of coxa II, anterolateral margins gently curved; posterior sternum (metasternum) with six setae, vaguely triangular.

Abdomen. First abdominal tergum located equally between metapeltidium and second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with 11 setae; segment XI with 11 setae; segment XII with two dorsal, three lateral, and seven ventral setae; lung book inlets oval; terga III to VII bearing very slightly darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII.

Flagellum. Lancetate, subtriangular, strongly depressed dorsoventrally, bearing 16 setae; dorsal surface bearing a pair of nearly circular, shallow depressions.

Chelicerae. Lateral aspect of basal segment bearing three setae, vertical group of three long, feathered setae flanking movable finger (second cheliceral segment), group of three shorter setae arranged basally on fixed digit, horizontal group of five setae arising on or near ventral margin; mesal surface of basal segment bearing group of three setae arranged nearly horizontally, lower group of two setae arranged diagonally, two short, stout setae in vertical line just below these, four setae directly below large dorsal seta, movable finger flanked by another vertical group of two long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing seven closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing row of about 20 long, feathered, distally curled setae near outer margin, another vertical row of 15 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia with no mesal,



FIGS. 8-10.—Flagellum, tarsus of leg I and pedipalp of *S. orthoplax*: 8, dorsal view of flagellum; 9, lateral view of tarsus of leg I; 10, lateral view of pedipalp. Scale for flagellum, one centimeter = .06 millimeter. Scale for tarsus and pedipalp, one centimeter = .25 millimeter.

subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $1 > 7 > 3$, $4, 5, 6 > 2$; anterolateral spur of coxa of leg II, 40 per cent as long as coxa proper; patella of leg III 65 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—*S. orthoplax* is very similar to *S. longimanus* Rowland, 1971, however, the distinctive elongation of the flagellum of the former and the elongation of the first legs in the latter are diagnostic, see Fig. 21 for comparison with the flagellum of *S. orthoplax*.

Measurements.—Total length of the holotype is 4.2. See also Table 1.

Variation.—Only one specimen of this species was available for study.

Distribution.—*S. orthoplax* is known only from Finca Cuauhtemoc, Chiapas, México.

Remarks.—*S. orthoplax* resembles *S. longimanus* and an undescribed Guatemalan species. These species can be united in a closely related species group that occupies at least southern México and Guatemala.

Etymology.—The specific epithet from Greek, *ortho*, meaning straight and *plac*, meaning flat, describing the flagellum.

Schizomus bartolo, new species

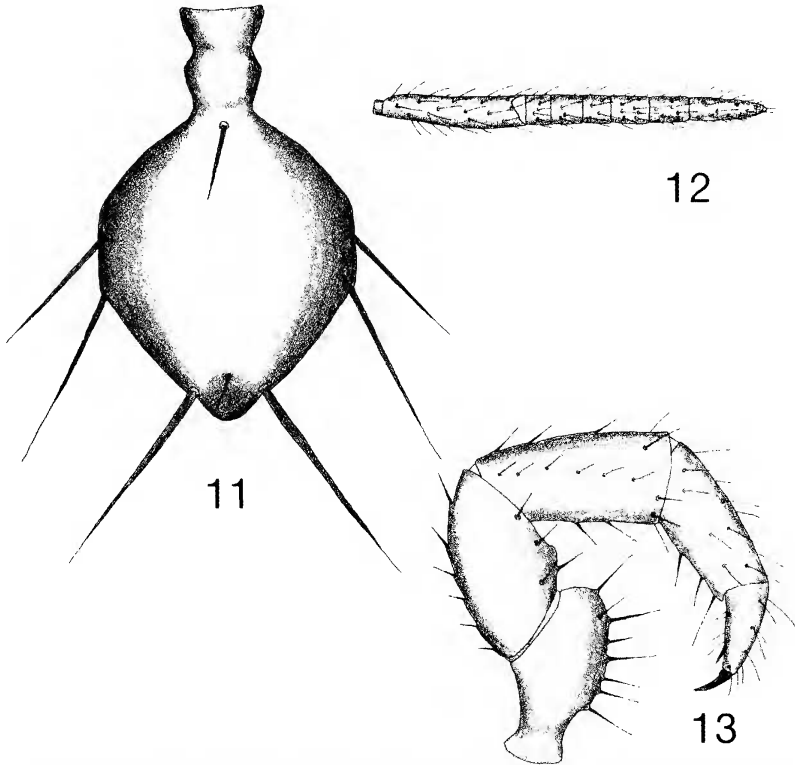
Holotype.—An adult male, taken in Gruta de San Bartolo, 16 km SW Monterey, Nuevo León, México, on 21 June 1969 by S. and J. Peck, and deposited in the American Museum of Natural History.

Allotype.—An adult female, taken at the same locality, on the same date, by the same collectors as the holotype, and also deposited in the American Museum of Natural History.

Paratypes.—Six adult females and four juveniles, taken at the same locality on the same date by the same collectors as the holotype; two adult females and two juveniles taken at the same locality during September 1971 by Terry Raines; all are deposited in the American Museum of Natural History.

Description.—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum), with three pair of dorsal and two apical setae, more than twice as long as wide, strongly convex, lateral margins nearly vertical, produced anteromesally as a basally blunt conical process; eye spots indistinct; mesopeltidia (second pair of cephalothoracic tergites) acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, emarginate posteriorly, anterior margin closely parallel with posterior



FIGS. 11-13.—Flagellum, tarsus of leg I and pedipalp of male of *S. bartolo*: 11, dorsal view of flagellum; 12, lateral view of tarsus of leg I; 13, lateral view of pedipalp. Scale for flagellum, one centimeter = .06 millimeter. Scale for tarsus and pedipalp, one centimeter = .25 millimeter.

margin of mesopeltidia, posterolateral margin of metapeltidial plates associated with small, narrowly curved plate; anterior sternum with 11 bifid setae, triangular, apex extending to caudal limit of coxa II, anterolateral margins curved; posterior sternum (metasternum) with six bifid setae, vaguely triangular; all ventral cephalothoracic setae bifid.

Abdomen. First abdominal tergum located equally between metapeltidium and second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven ventral setae; segment XI with nine setae; segment XII with two dorsal, three lateral and six ventral setae; lung book inlets circular; terga III to VII bearing nearly invisible apodemes of dorsoventral muscles; vestigial stigmata not visible on sterna V to VII; all ventral abdominal setae bifid.

Flagellum. Nearly orbital, somewhat dorsally compressed, bearing 16 setae; no dorsal depression, ventrally convex.

Chelicerae. Lateral aspect of basal segment bearing four setae, vertical group of seven long, feathered setae flanking movable finger (second cheliceral segment), group of two shorter setae arranged basally on fixed digit, horizontal group of three setae arising on or near ventral margin; mesal surface of basal segment bearing group of three setae arranged horizontally, lower group of four setae arranged in a group, two short, stout setae in a vertical line just between these, four setae directly below large dorsal seta, movable finger flanked by another vertical group of three long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing seven closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 13 long, feathered, distally curled setae near outer margin, another vertical row of 18 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $1 > 7 > 5$, $6 > 3 > 4 > 2$; anterolateral spur of coxa of leg II 40 per cent as long as coxa proper; patella of leg III 65 per cent as long as tibia; length of segments given in Table 1.

Females differ from males in the following respects: First legs proportionately smaller than in male; lengths of segments given in Table 1. Flagellum long, rod shaped, with two annulations, the terminal section longer than the previous two; abdominal sternum II strongly emarginate posteriorly.

Comparisons.—This singular species shows some similarity to *S. firstmani* but it is the only species of this genus in México that has so little relief on the dorsum of the male's flagellum. The bifid nature of the ventral setae is shared with *S. firstmani*.

Measurements.—The total length of the male holotype and the female allotype, both from the type locality, is 3.7, and 4.2, respectively. See Table 1.

Variation.—No variation disproportionate to variation in body length was noticed in the females.

Distribution.—*S. bartolo* is known only from Gruta de San Bartolo, 16 km SW Monterey, Nuevo León, México.

Remarks.—*S. bartolo* shows remarkable cave adaptation. Juveniles and adults are very pale and are notably paler than epigeal species. The front legs are fairly long, though not proportionately as long as in *S. longimanus* or *S. pecki*. Another interesting feature of this species is the bifid nature of all ventral setae. Most other schizomids have bifid setae limited to the ventral portions of abdominal segments IX, X, and XI.

Etymology.—The specific epithet from Gruta de San Bartolo, used in apposition.

Schizomus firstmani, new species

Holotype.—An adult male, taken at Grutas de Atoyac, 2 km E Atoyac, Veracruz, México, on 24 December 1971 by D. McKenzie, and deposited in the American Museum of Natural History.

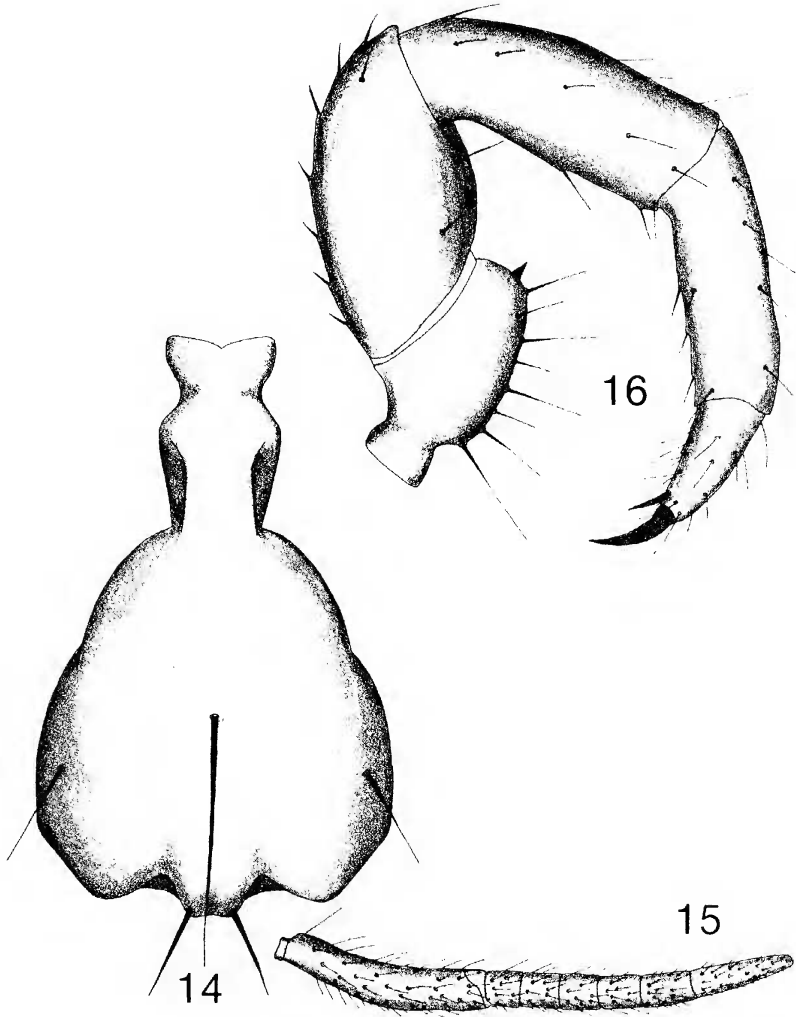
Allotype.—An adult female, taken at the same locality as the holotype on 6 August 1969 by S. and J. Peck and also deposited in the American Museum of Natural History.

Paratypes.—An adult female and three juveniles taken at the same locality on the same date by the same collectors as the allotype; a juvenile taken at the same locality on the same date by the same collector as the holotype; an adult female and three juveniles taken at the same locality on 22 August 1965 by J. Reddell, J. Fish, and W. Bell; all are deposited in the American Museum of Natural History.

Description.—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with three pair of dorsal and two apical setae, a little less than twice as long as wide, gently convex, lateral margins nearly vertical, produced anteromesally as a basally blunt, conical process; eye spots indistinct; mesopeltidia (second pair of cephalothoracic tergites) triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, slightly emarginate anteriorly, anterior margin closely parallel with posterior margin of mesopeltidia, posterolateral margin of metapeltidial plates associated with small, narrowly curved plate; anterior sternum with nine bifid setae, triangular, apex extending just beyond caudal limit of coxae II, anterolateral margins gently curved; posterior sternum (metasternum) with six bifid seta, vaguely triangular.

Abdomen. First abdominal tergum located equally between metapeltidium and second abdominal tergum, triangular; terga II to VII with two setae; terga VIII and IX with four setae; segment X with



FIGS. 14-16.—Flagellum, tarsus of leg I and pedipalp of male *S. firstmani*: 14, dorsal view of flagellum; 15, lateral view of tarsus of leg I; 16, lateral view of pedipalp. Scale for flagellum, one centimeter = .06 millimeter, for tarsus and pedipalp, .25 millimeter.

seven setae; segment XI with seven setae; segment XII with seven ventral, six lateral, and four dorsal setae; lung books vaguely visible under second abdominal sternum; terga III to VII bearing nearly invisible apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII; all ventral abdominal setae bifid.

Flagellum. Bulbous, slightly depressed dorsally, bearing 16 major and six minor setae, convex ventrally.

Chelicerae. Lateral aspect of basal segment bearing three setae, vertical group of two long, feathered setae flanking movable finger (second cheliceral segment), group of two shorter setae arranged basally on fixed digit, horizontal group of six setae arising on or near ventral margin; mesal surface of basal segment bearing group of two setae arranged horizontally, lower group of three setae arranged diagonally, two short, stout setae vertically in line just below these, four setae directly below large dorsal seta, movable finger flanked by another vertical group of two long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing eight closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 21 long, feathered, distally curled setae near outer margin, another vertical row of 20 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $1 > 7 > 6 > 3$, 4, $5 > 2$, basal segment greatly curved; anterolateral spur of coxa of leg II 40 per cent as long as coxa proper; patella of leg III 60 per cent as long as tibia; length of segments given in Table 1.

Females differ from males in the following respects: First legs proportionally shorter than in males, basal segment of tarsus not strongly curved, length of leg segments given in Table 1. Abdominal segments X and XI narrower than the males; flagellum rod shaped, with two annulations, terminal section longer than previous two.

Comparisons.—This species can be confused only with *S. bartolo*. The males of each of these species have nearly equally bulbous flagella, but that of *S. firstmani* is blunt posteriorly. Both of these species appear cave adapted, and both have bifid ventral setae, a greater bifurcation occurring in *S. firstmani*.

Measurements.—The total lengths of the male holotype and the female allotype, both from the type locality, are 5.0, and 4.7, respectively. See Table 1.

Variation.—No variation disproportionate to variation in total body length was noticed in the females.

Distribution.—*S. firstmani* is known only from Grutas de Atoyac, Veracruz, México.

Remarks.—*S. firstmani* appears to have its closest affinities to *S. bartolo*, another cave adapted form, which occurs in northern México. The relationships of these species will have to be confirmed by further collecting in intervening localities.

Etymology.—The specific epithet is a patronym, given in honor of Dr. Bruce Firstman, California State Polytechnic College, Pomona.

Schizomus pecki, new species

Holotype.—An adult male, taken in Las Grutas de Coconá, 2 mi NE Teapa, Tabasco, México, on 1 August 1948 by C. Goodnight and deposited in the American Museum of Natural History.

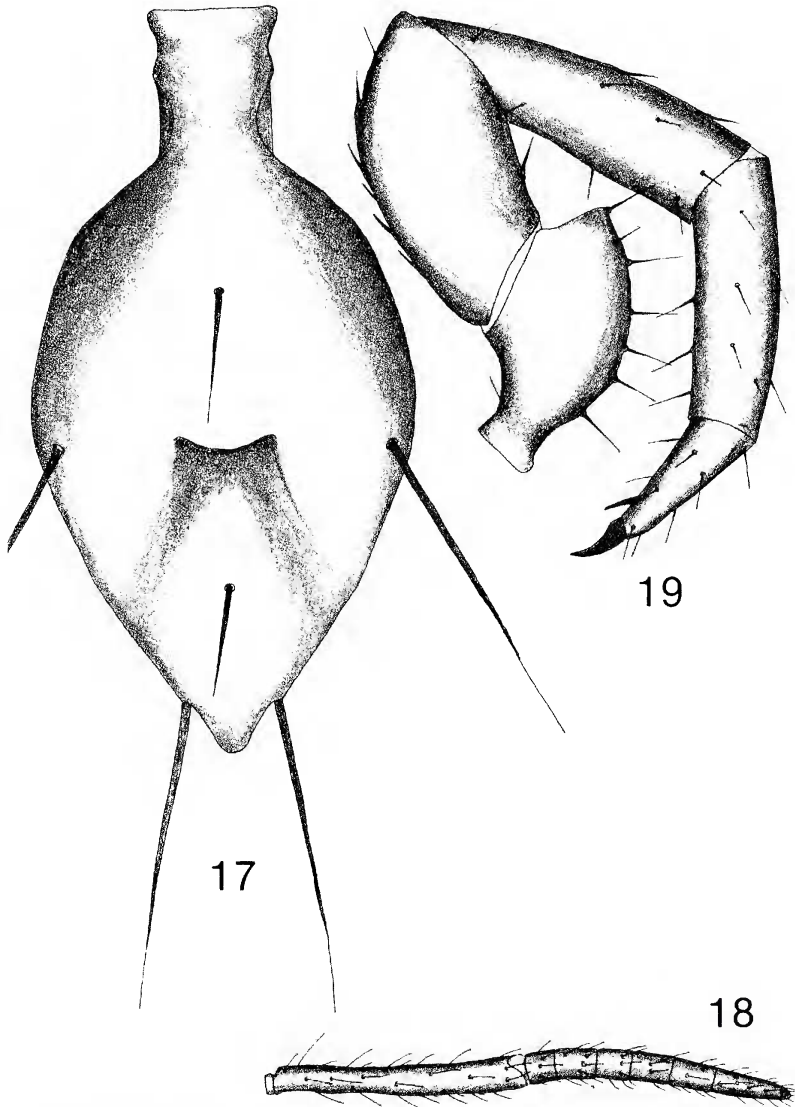
Allotype.—An adult female, taken at the same locality on 29 November 1971 by D. McKenzie and also deposited in the American Museum of Natural History.

Paratype.—An adult female taken at the same locality on the same date by the same collector as the allotype and deposited in the American Museum of Natural History.

Description.—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with two pair of dorsal and two apical setae, a little less than twice as long as wide, strongly convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots vaguely distinct as circular, pale areas on anterolateral surface of carapace; mesopeltidia (second pair of cephalothoracic tergites) fairly deeply triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, not emarginate posteriorly, as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidia, posterolateral margins of metapeltidial plates associated with long, narrowly curved plate; anterior sternum with nine setae, triangular, apex extending just beyond caudal limit of coxae II, anterolateral margins gently curved; posterior sternum (metasternum) with six setae, vaguely triangular.

Abdomen. First abdominal tergum located equally between metapeltidium and second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, three lateral, six ventral setae; lung books vaguely distinct



FIGS. 17-19.—Flagellum, tarsus of leg I and pedipalp of male *S. pecki*: 17, dorsal view of flagellum; 18, lateral view of tarsus of leg I; 19, lateral view of pedipalp. Scale for flagellum, one centimeter = .06 millimeter, for tarsus and pedipalp, .25 millimeter.

under second abdominal sternum; terga III to VII bearing slightly darkened apodemes of dorsoventral muscles; vestigial stimata appearing as very dark areas on sterna V to VII.

Flagellum. Bulbous, horizontally compressed, bearing 16 setae; dorsal surface with a deep distal depression, convex ventrally.

Chelicerae. Lateral aspect of basal segment bearing three setae, vertical group of three long, feathered setae flanking movable finger (second cheliceral segment), group of two shorter setae arranged basally on fixed digit, horizontal group of eight setae arising on or near ventral margin; mesal surface of basal segment bearing group of two setae arranged horizontally, lower group of six setae arranged in a clump, another short, stout seta just below these, four setae arranged in a vertical line, four setae directly below large dorsal seta, movable finger flanked by another vertical group of three long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing 11 closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 23 long, feathered, distally curled setae near outer margin, another vertical row of 24 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $1 > 7 > 3, 4, 5, 6 > 2$; anterolateral spur of coxa of leg II 50 per cent as long as coxa proper; patella of leg III 70 per cent as long as tibia; length of segments given in Table 1.

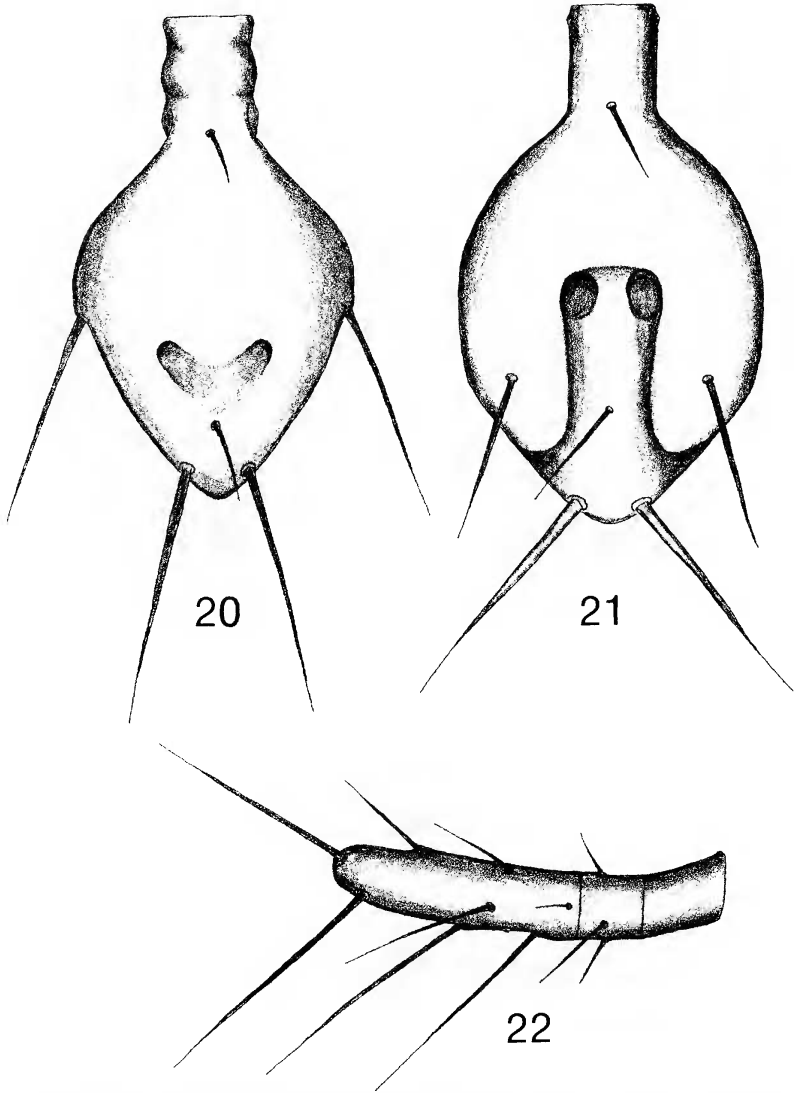
Females differ from males in the following respects: First leg proportionately shorter than in males; length of segments given in Table 1. Flagellum long, rod shaped, with two annulations, terminal section longer than previous two.

Comparisons.—*S. pecki* is closely related to *S. reddelli* Rowland, 1971, *S. davisii* Gertsch, 1940, and *S. mexicanus*, but is most similar to the latter. *S. pecki* is larger than *S. mexicanus*, the latter being 4.3 to 4.4 millimeters in total length, but the flagella of the males are quite similar, see Fig. 20 for comparison with the flagellum of *S. pecki*.

Measurements.—Total length of the holotype and allotype is 5.6 and 6.4, respectively. See Table 1.

Variation.—No variation disproportionate to variation in total length was noticed in the females.

Distribution.—*S. pecki* is known only from Las Grutas de Coconá, 2 mi NE Teapa, Tabasco, México.



FIGS. 20-22.—Flagella: 20, dorsal view of male *S. mexicanus*; 21, dorsal view of male *S. longimanus*; 22, lateral view of female *S. mexicanus*. Scale, one centimeter = .06 millimeter.

Remarks.—This species shows a very close affinity to several species in the Sierra de El Abra and Sierra de Guatemala, Tamaulipas, México (see comparisons). *S. pecki* represents a substantial geographic extension for this species group. Further collecting will prob-

ably show that this species group is widespread through eastern, central, and southern México.

Etymology.—The specific epithet is a patronym, given in honor of Dr. William Peck, Central Missouri State College, Warrensburg.

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